

SCALE AQ

We are the
future of
aquaculture

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Audun Fjeldvær

Audun Fjeldvær
CEO, ScaleAQ



A Norwegian based company, providing high-quality solutions and services for the fish farming industry world-wide.

900
employees

3.4 billion
NOK
in revenue

2.3 billion
NOK
order reserve

33
locations in
8 countries



We are the future of aquaculture

ScaleAQ is a leading global technology provider that supplies and manufactures complete sites for the aquaculture industry in more than 40 countries. The company has approximately 900 employees and offices in Norway, Scotland, Poland, Iceland, Chile, Canada, Tasmania and Vietnam.

Through focus on sustainability and biology, ScaleAQ has taken a clear role in ensuring the development of technology on the terms of biology and the environment. We do this by producing and delivering technology, infrastructure and services in a solid, sustainable and innovative way.

The unique strength of our brand lies with our people. We are proud to employ 900 of the most competent, solid and innovative brains within aquaculture. Solid people make solid sustainable business, for our customers and for ScaleAQ. Local presence means strong relations, being there, rubbing shoulders and solving challenges hands-on.

NORWAY

Trondheim

- Alta
- Skjervøy
- Tromsø
- Finnsnes
- Harstad
- Tovik
- Bodø
- Sandnessjøen
- Herøy
- Rørвик
- Stjørdal
- Frøya
- Hitra
- Skodje
- Florø
- Bergen
- Austevoll
- Bømlo
- Haugesund

CANADA

- Campbell River
- Saint John
- Newfoundland

CHILE

- Puerto Natales
- Puerto Varas

UK & IRLAND

- Fort William
- Shetland

POLAND

- Gdynia

ICELAND

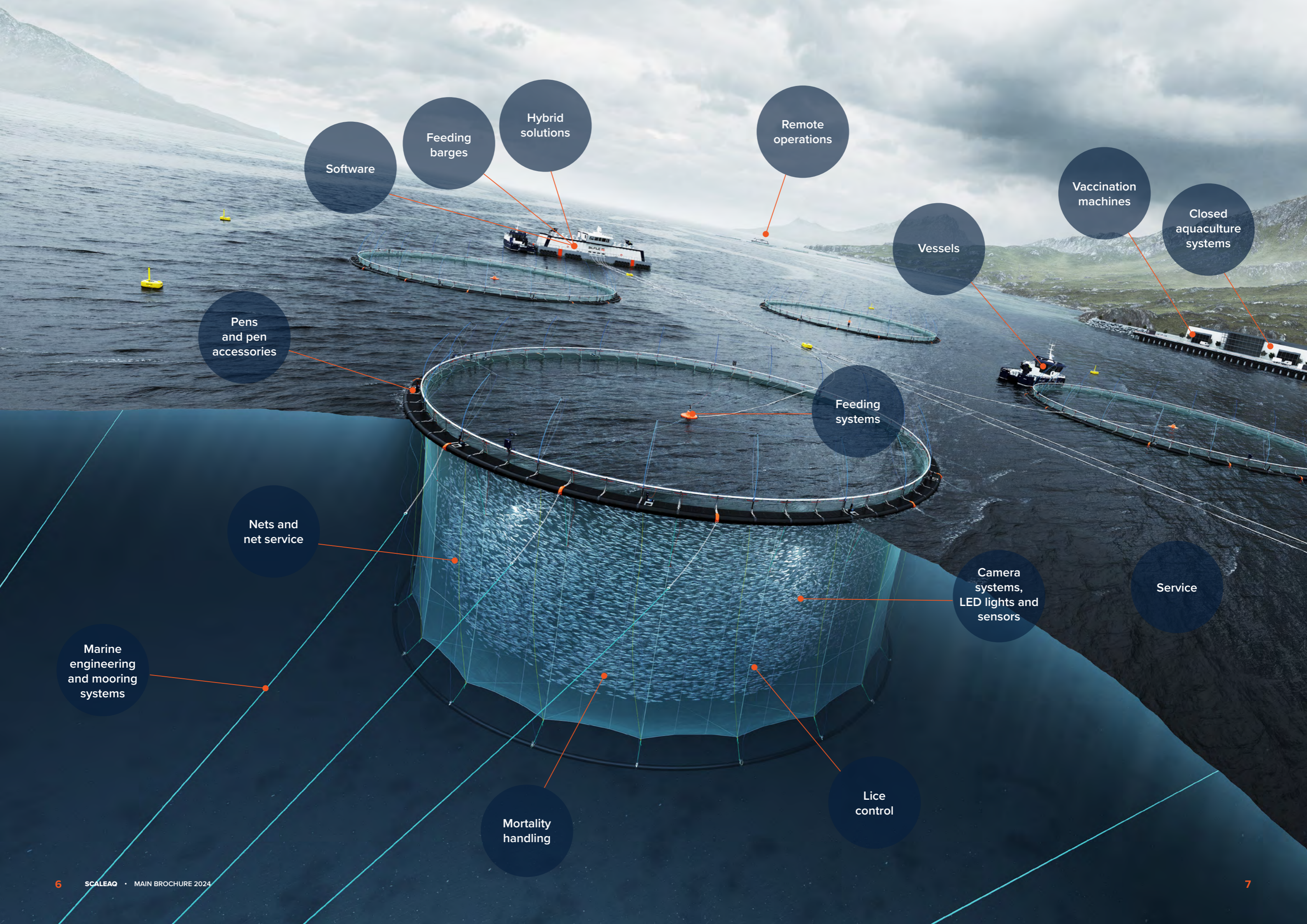
- Reykjavik

VIETNAM

- Nha Trang
- Hanoi

TASMANIA

- Hobart
- Huonville



Software

Feeding barges

Hybrid solutions

Remote operations

Vaccination machines

Closed aquaculture systems

Vessels

Pens and pen accessories

Feeding systems

Nets and net service

Camera systems, LED lights and sensors

Service

Marine engineering and mooring systems

Mortality handling

Lice control



Pen, net and mooring

Pens float at the intersection between man and nature. They are a safe workplace and provide a comfortable home for your fish. In our capacity as one of a very few equipment suppliers, we are an approved supplier of floating collars, nets and mooring equipment. We know how important the interaction that occurs between the components in a pen is for creating a safe, comfortable environment. With your knowledge of the surrounding area, combined with thorough site surveys and our longstanding experience, we ensure that your pens will be suitable for the conditions in which they float – e.g. the inner reaches of a fjord or out on exposed sites where the weather and wind are at their most extreme.



Pens

ScaleAQ has been one of the world's leading developers and manufacturers of pens for over 40 years. The guiding principle behind our success has been the combination of the flexibility of high density polyethylene plastic and strong steel, with the focus on the interaction between the moorings and net with the pen collar to spread the strain throughout the entire structure. A major design feature of our pens is the integrated energy-distribution system.

Adapted to local conditions

Our pens may be adapted to all locations, from sheltered locations to very exposed areas. You are free to choose the pen that is best suited to your operation and your area, to ensure that the investment is optimal. We offer more than 100 certified pens with a circumference from 70 to 300 meters.

elements for power uptake are thoroughly checked and that the safety requirements are met.

Certification in all links

As one of very few suppliers of equipment to the fish farming industry, ScaleAQ is an approved supplier of pens, nets and mooring equipment. Both at home as well as abroad, we exclusively employ certified plastic welders with considerable experience of pen assembly. Our certificates are approved in accordance with the requirements of NS9415.

Quality

We have developed methods for detailed design of our pens. By determining the movement of the forces throughout the pen, we make sure that all

Pen accessories

Our range of accessories and extra equipment for pens ensure that our already hardy solutions are even more secure and efficient. Over the years, we have developed a selection of products that streamline operations by the edge of the pen and improve the safety of all personnel, fish and equipment. Extra equipment completes your aquaculture facility and ensures it is safe. Please get in touch if you have an idea or a need that is not covered.



Antistatic feed pipes



Fixed tarp holder



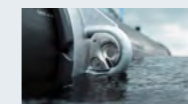
Mooring bracket fender



Feed pipe holders



Net quick coupling



Mooring lug insert



Complete pen sign holder



Complete rescue ladder for pens



Universal bracket modules



HDPE net hook protector



Electrical cabinet module



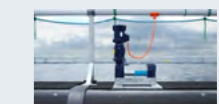
Bird net with fiberglass rod



Universal bracket for extra equipment



Hinged net hook



Winch system for sinker tube



Vortex®

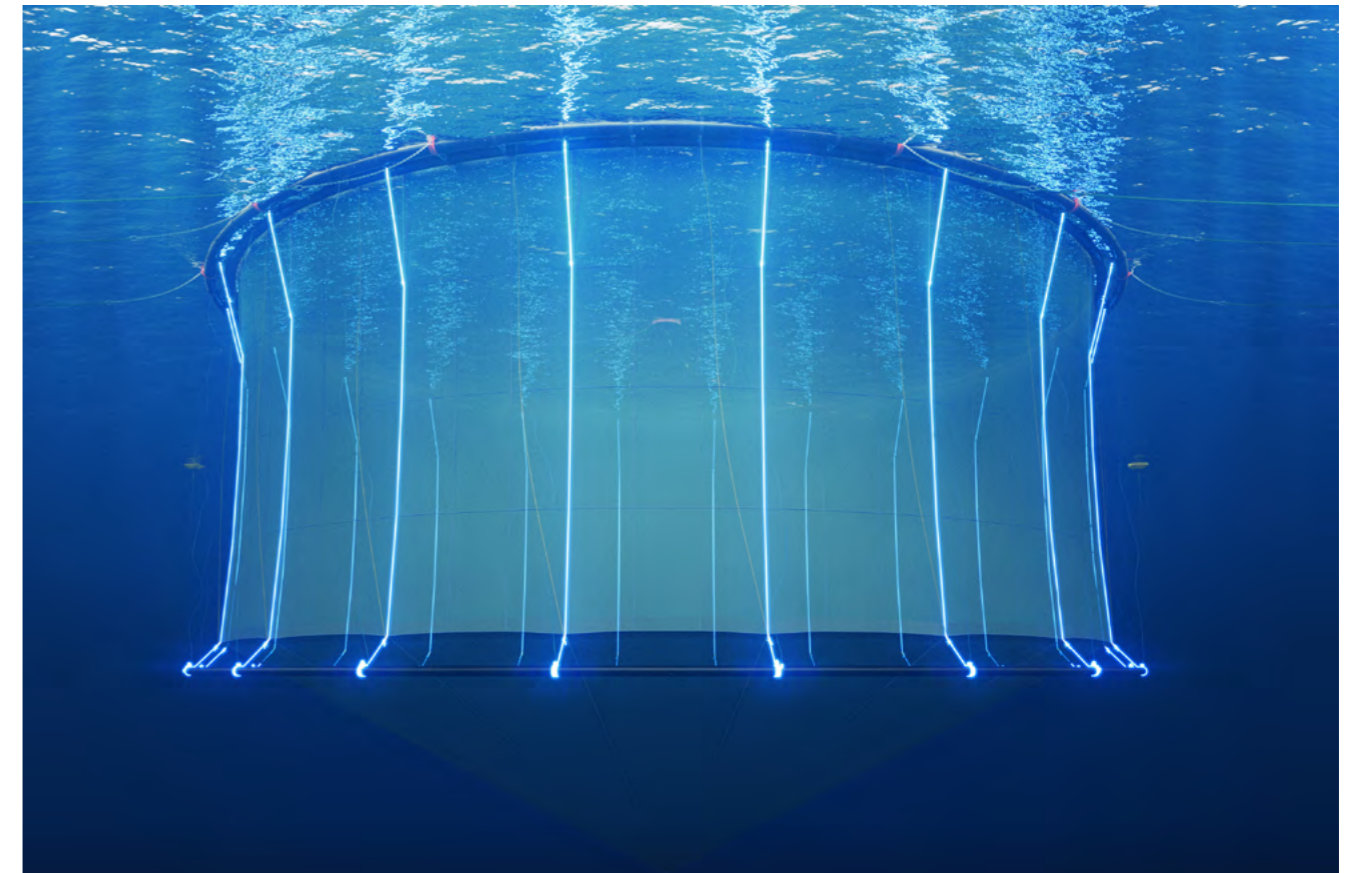
Semi-closed system

- ▶ Significantly reduced lice infestation
- ▶ Protects fish against algae
- ▶ Ensures stable water temperatures
- ▶ Provides more stable oxygen conditions in the pen
- ▶ Adjustable water pressure
- ▶ Cost-effective solution compared to alternative closed solutions

Subsea

Submerged system

- ▶ 157 meters Midgard ring
- ▶ Net on total 44 000 m³
- ▶ Air dome included in the net roof
- ▶ Exposed environments, Hs 6m and current of 1,2 m/s
- ▶ Uses ScaleAQs new dead fish system
- ▶ Camera for surveillance and extended use of LED lights
- ▶ Water feeding delivered by ScaleAQ



Midgard System®

The ScaleAQ Midgard® System is a complete pen system where all components work together to secure both fish and farmers.

The system is the result of several years of hard work to find new, improved solutions within net pen technology – including pens, sinker tubes and nets. During development of the concept, we worked closely with Lerøy, Mowi and Salmar. We conducted exhaustive model tests at the Marintek Marine Laboratory, plus a number of full scale tests at several exposed locations.

The objective was to prevent escapes, improve fish welfare and boost health and safety conditions for workers. The ScaleAQ Midgard® System thereby satisfies most requirements for the salmon farming industry of the future.

Midgard® System

- ▶ Customised sinker tube provide optimum interplay
- ▶ Sinker tube suspended direct from net baseline rope
- ▶ Lifting/lowering ropes completely slack and independent of the rest of the system

Midgard® Winch system

- ▶ Raising and lowering the sinker tube evenly
- ▶ Fast, efficient raising and lowering
- ▶ Only need for an aggregate for the winches

Mooring systems

ScaleAQ's mooring systems are adapted to the demanding environments they will operate in and provide a safe and robust investment. Mooring equipment has to tolerate winds and weather at the most extreme. That's why we make maximum use of our knowledge of our field, 40 years of experience in the industry and thorough analysis and calculations to ensure complete robustness. This is why mooring systems from ScaleAQ meet not only our criteria, but also the requirements of the customer and the authorities to become a safe, robust investment.

The starting point for good mooring systems is in-depth knowledge of the location the facility is to be deployed in. ScaleAQ has highly qualified employees and the most up to date tools of analysis available for the dimensioning of moorings. We combine your experience with advanced location investigations. Computer programs provide the opportunity of simulating the conditions on a given site on a stormy day. Floating collars, nets and all

moorings are being modeled in the program. By entering data for currents, winds and waves for the location, the computer program calculates the forces the mooring and the floating collar and net will be subjected to within the safety margins which are required in the NS9415 standard. This facilitates optimization of the components of which the mooring system consists.

This is what you get when you choose a ScaleAQ mooring system

- ▶ Certified according to NS9415
- ▶ Certified according to the NYTEK regulation
- ▶ Standardised components
- ▶ Complete documentation of the entire system
- ▶ Complete system – all parts designed for each other
- ▶ In-house expertise for mooring analyses: Marine Engineering
- ▶ In-house and third party inspections of all components that we do not produce ourselves
- ▶ Tested in simulations and in practice over many years



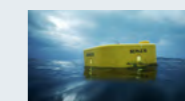
Anchors



Anchor chains



AQ Ring



Buoys



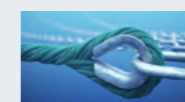
Anchoring bolt



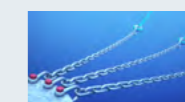
Mooring plate



Galvanized long chain



Thimbles



Chain slings



Marker lights SABIK



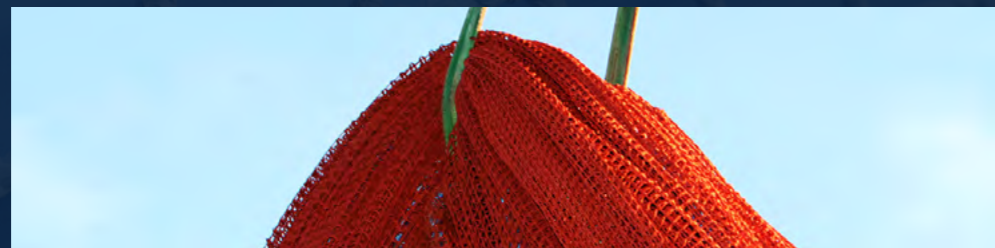
Shackles



Rope



Galvanized master links



Net service

Our service station at Hestnes has 30 years of experience in net cleaning, disinfection, repair work and antifouling treatment for all types of nets used in aquaculture. It is vital that the antifouling and coating that are chosen are suitable for use in your location. At ScaleAQ, we have more than 30 years of experience in selecting the products best suited to a range of different nets and locations.

How we service and maintain nets:

- ▶ New nets are checked upon arrival.
- ▶ Old nets are washed, inspected and repaired.
- ▶ Nets may be immersed in an antifouling treatment bath.
- ▶ Nets are vacuum treated in the impregnator.
- ▶ Surplus antifouling following all treatments is fed back into the antifouling bath.
- ▶ Nets are dried.
- ▶ Nets are packed, secured and sent to the customer.

Nets

Nets, together with floating collars and moorings, are one of the key components in any aquaculture facility, and must be optimized to the rest of the setup and conditions at the site.

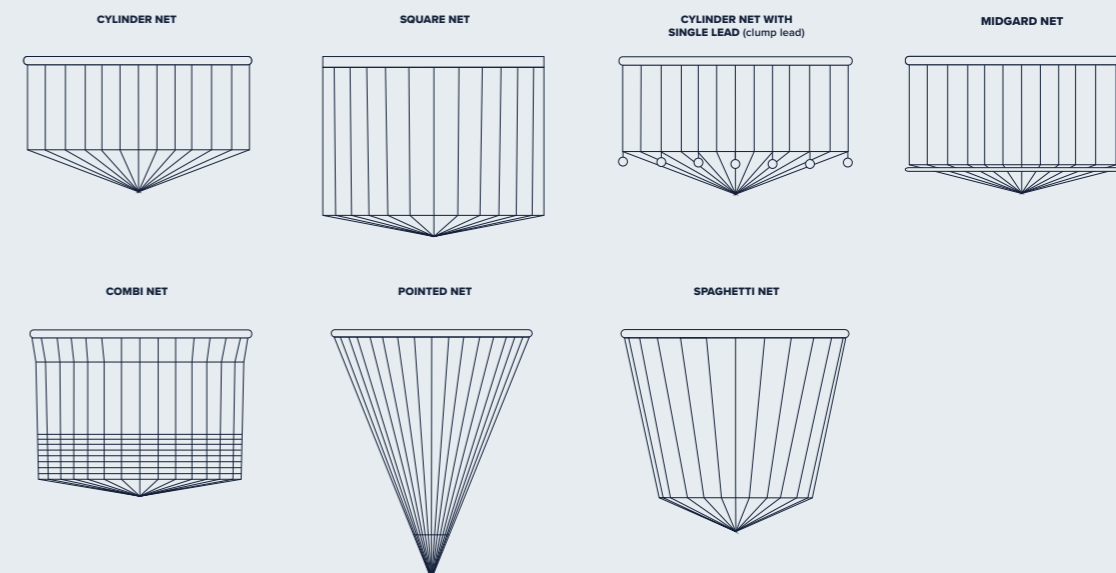
The optimal fit provides minimal risk of wear and tear against other key components. Extra hardlaid ropes in the net framework and hand-lacing ensure the optimum fit from the first day at sea and throughout the lifetime of the net. Hand lashing netting to all ropes using double thread and knot locks for one out of every three meshes ensures solid, long-life nets. ScaleAQ works closely together with customers

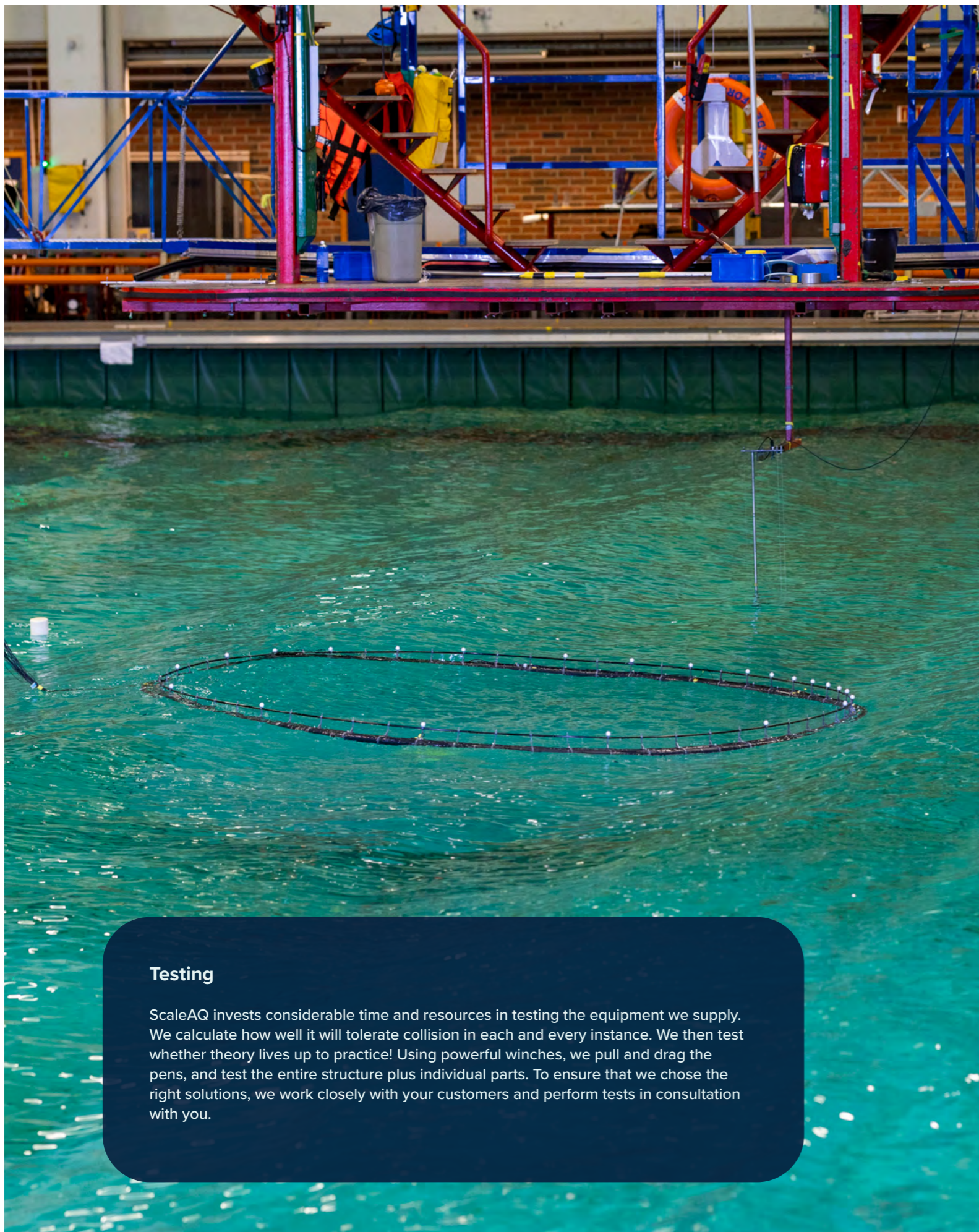
and subcontractors to find the best solutions for the salmon farming businesses of today and tomorrow.

We can supply our nets in a range of materials: Nylon; Polyester; (Define ULTIMA and ULTRA, knotted and Rachel HDPE and UHMWPE.) We use only high quality netting in accordance with the current Norwegian Standard NS9415.

Net design

Nets are a vital part of the bigger picture and need to be adapted as best as possible to the rest of the facility. At the same time, we know that conditions and preferences vary, and that not everyone is looking for a full facility. Or needs the most expensive or robust options. That does not mean that we cut corners on quality of requirements – instead, we make design and material recommendations based on the conditions that apply in each individual case.





Testing

ScaleAQ invests considerable time and resources in testing the equipment we supply. We calculate how well it will tolerate collision in each and every instance. We then test whether theory lives up to practice! Using powerful winches, we pull and drag the pens, and test the entire structure plus individual parts. To ensure that we chose the right solutions, we work closely with your customers and perform tests in consultation with you.

Marine Engineering

Our engineers have long experience and considerable know-how within aquaculture and offshore technology. They find the most cost-effective and safest solutions for any location.

ScaleAQ has extensive experience within calculations and dimensioning of marine constructions, including structural and hydrodynamic analyses for fish farm mooring, barge mooring, pens, nets and other constructions.

Our engineers cover a wide range of competence and knowledge on fish farming and offshore constructions. Hence, they develop the most cost-effective and reliable solutions for any location.

All evaluations take into account customers specific scope and requirements. Furthermore, all calculations are done according to current regulations and standards.

Analyses

The desired solutions for top quality mooring systems, nets and pens is found through location specific analyses.

ScaleAQ has highly qualified personnel and the most advanced analysis tools within dimensioning mooring.

We combine your experience with advanced location classification. Our software programs enable us to simulate conditions at a given locality on a stormy day. Pens, nets and mooring system are all modelled. We enter current and wave data for the location and then calculate the forces anchors and pens will be submitted to within the safety margins required by standard NS9415. That makes it possible to optimise the components the mooring system consists of.

As an extra safety feature, we perform final evaluation of the finished mooring system when in place. We analyse your information and other data before submitting the final report to you.

Marine engineering undertakes:

- ▶ Certification
- ▶ Mooring analyses
- ▶ Constructional analyses (Element and 3D+2D-analyses)
- ▶ Capacity analyses for certification and deliverables
- ▶ Research and development
- ▶ All deliverables (project planning, analyses, drawings, installation)
- ▶ Drawing and production of components
- ▶ Site visits
- ▶ Project management



Feeding and monitoring

You need to be aware of and have control of the whole pen in order to ensure that your fish have an appetite, have the right amount of feed, have good living conditions and are safe. With our advanced, reliable technology, which has been developed with the help of our customers over the decades, you can monitor and feed your fish with precision and simplicity. We will provide you with experts who will help you to install the best technology for looking after your fish, the environment and your operating budget.

Feeding

Feeding is perhaps the most important job in aquaculture. The optimized feeding of fish is a complex operation that relies on both experience and expertise, as well as the right tools for the job. There are no shortcuts to optimal results, but regardless of whether you feed from a landbased facility or on a barge, using a centralized feeding system or feed cannons, we have tools that handle the pellet gently and ensure optimized distribution in the pen.

Global presence, local service

With 34 offices spread across eight countries, service and maintenance options for your feeding system are never far away. We offer maintenance programs that ensure maximum uptime for your feeding system, but in the event that you encounter problems we will be able to assist you via our support service or by expediting the dispatch of local technicians to your site.

Experience

With almost 40 years of experience, we have dealt with almost every issue in the book. No matter how you want to feed your fish, we have a solution that fits. We have installed around a thousand feeding systems across the globe for a variety of fish species. You can count on us to deliver.

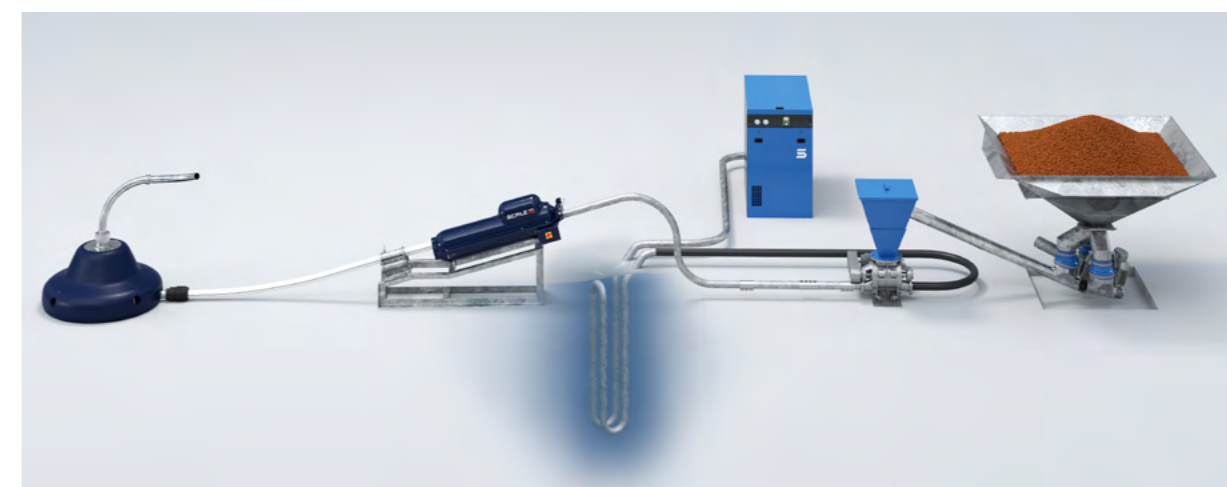
Software

We supply our own proprietary software FeedStation together with centralized feeding system. However, in line with our philosophy about openness and freedom of choice, you can also control the system

using third party solutions. We offer open APIs for management and data flow. This means that centralized ScaleAQ feeding systems can easily be fitted into infrastructure featuring technology and equipment from different suppliers.

Quality

As our customer, you get one of the most user-friendly centralized feeding systems on the market – a robust and reliable system that gives you full control over the feeding process, regardless of your feeding strategy. We have installed over 900 centralized feeding systems at aquaculture facilities both on- and offshore. This makes us an expert in the field and a valuable partner when you are planning an update to your existing facility or want to discuss feeding solutions at a new site. The system handles the feed gently – from silo to fish. It features integrated cameras, sensors and remote control systems, and comes with built-in automatic integration to production management systems such as Mercatus Farmer. All components are carefully selected to provide you with easy and carefree maintenance, as well as long



The mechanical part of the centralized feeding system – from silo to spreader.





FeedStation feeding system:

Open management APIs: Yes	Kg per min min: 0,042	Transport lengths: 0–900m
Hose sizes: 50mm, 90mm	Open information APIs: Yes	Minimum dose: 16 grams
Kg per min max: 72	Ready for remote operation: Yes	

service intervals – resulting in lower costs to you. Our system consists of high quality industrial components. All parts of our feeding systems meet our quality requirements, meaning that we always deliver the most reliable systems.

Flexible

We customize systems to meet all your feeding needs, and our systems support all modern methods of feeding fish. The centralized feeding system can deliver pellets unscathed at a distance of up to 900 meters from the select valve, and simultaneously from two silos containing different pellet sizes.

Gentle feed treatment

We are all aware of the need to avoid minor damage to and crushing of feed. We supply systems with the same pipe dimensions throughout the system. We also avoid using joints in the distribution valve. There are no sharp edges, and we ensure that all angles in

bends and pipes are optimized to prevent turbulence and in order to guarantee that the feed is whole when it reaches the fish.

Integration

Our feeding systems feature integrated external hardware such as cameras, environmental sensors and remote control systems to give you full control over your daily feeding routine on site. In addition, we also offer full integration with our software products for production control, planning and finance.

System maintenance

We offer system maintenance of mechanical components and software. Regular checks ensure stability and reliability in the long-term. Highly qualified personnel carry out detailed inspections and subsequently deliver comprehensive reports with recommended and preventive measures.



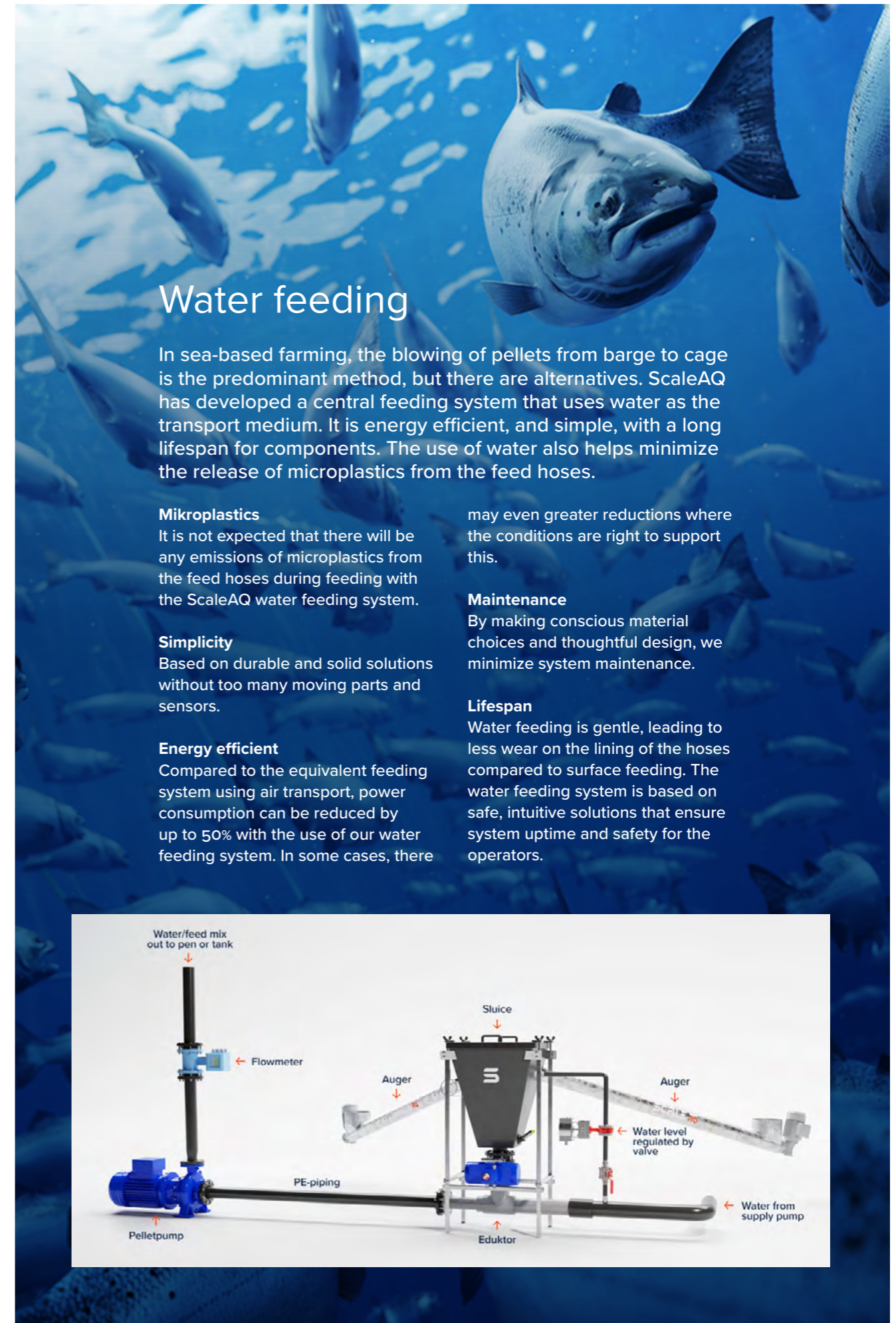
SmartSpreader™

SmartSpreader™ is a motorized spreader designed to spread feed even better.

The operator can select a pre-defined throwing length or can allow the spreader to follow a specific pattern that ensures an even distribution of pellets across the entire pen surface. Controlling and adjusting the spreader at pen level is easy thanks to our FeedStation software.

Why choose the SmartSpreader™

- ▶ The SmartSpreader™ is ideal for use when feeding during the start-up phase. By spreading the feed where the fish are instead of the fish having to seek out the feed, more fish will benefit from good feed access and you will achieve smoother and faster growth across your fish stock.
- ▶ Using the spreader is also advantageous when fish are large. Large fish tend to swim closer to the edge of the pen, so by adjusting the throwing length to this you can ensure all fish in the pen have good feed access.
- ▶ To date, strong wind and current conditions have been a challenge when it came to feeding. Without any ability to adjust your throwing length, there can be circumstances in which feed either blows away or is drawn out of the pen before the fish are able to eat it. On days like this, you are now in the position to adjust your throwing length to ensure the best possible availability.



Water feeding

In sea-based farming, the blowing of pellets from barge to cage is the predominant method, but there are alternatives. ScaleAQ has developed a central feeding system that uses water as the transport medium. It is energy efficient, and simple, with a long lifespan for components. The use of water also helps minimize the release of microplastics from the feed hoses.

Mikroplastics

It is not expected that there will be any emissions of microplastics from the feed hoses during feeding with the ScaleAQ water feeding system.

Simplicity

Based on durable and solid solutions without too many moving parts and sensors.

Energy efficient

Compared to the equivalent feeding system using air transport, power consumption can be reduced by up to 50% with the use of our water feeding system. In some cases, there

may even greater reductions where the conditions are right to support this.

Maintenance

By making conscious material choices and thoughtful design, we minimize system maintenance.

Lifespan

Water feeding is gentle, leading to less wear on the lining of the hoses compared to surface feeding. The water feeding system is based on safe, intuitive solutions that ensure system uptime and safety for the operators.



Camera systems

ScaleAQ is a world class supplier of cameras for the global aquaculture industry. Since 1985, we have been helping aquaculture operators to perfect feeding using video images from their pens, and we know of several cases where our cameras continue to work superbly after more than 20 years under water. With solid experience and documented high quality products, ScaleAQ is the natural choice when you want a future-oriented camera solution that will last for many years to come.

Global presence, local service

With 34 offices spread across eight countries, service and maintenance options for your camera solution are never far away. We offer maintenance programs that ensure maximum uptime for your camera system, but in the event that you encounter problems we will be able to assist you via our support service or by expediting the dispatch of local technicians to your site.

More than just live images

The primary task of an underwater camera is to deliver good images of the fish in the pen to the control room on the feeding barge or a remote feeding centre. In addition, the cameras are constantly given new tasks such as indicators of environmental status in the pen, early warning of changes in fish behaviour or as inspection cameras of nets or dead fish. The basis for such tasks is a video stream – and the better the camera, the better the analysis. It is also important that the customer should be able to decide

where the video stream should be sent, where it should be downloadable and which analyses should be used. To put it briefly: the camera system you choose must be of high quality, trustworthy and have the necessary flexibility to integrate with algorithms or technologies from different vendors via open interfaces.

ScaleAQ extends your feeding window

All cameras supplied by ScaleAQ provide you with an image specially tuned to read the appetite of the fish. The quality of the image is not determined by the number of pixels, even though it can be all too easy to think that. The lens and transmission technology, not to mention the light sensitivity, all play a vital role in enabling you to see the fish as clearly as possible in the morning and as late as possible in the afternoon and evening. This is why ScaleAQ offer the most light sensitive cameras available on the market. As long as the fish can see the pellet, you can see the fish.

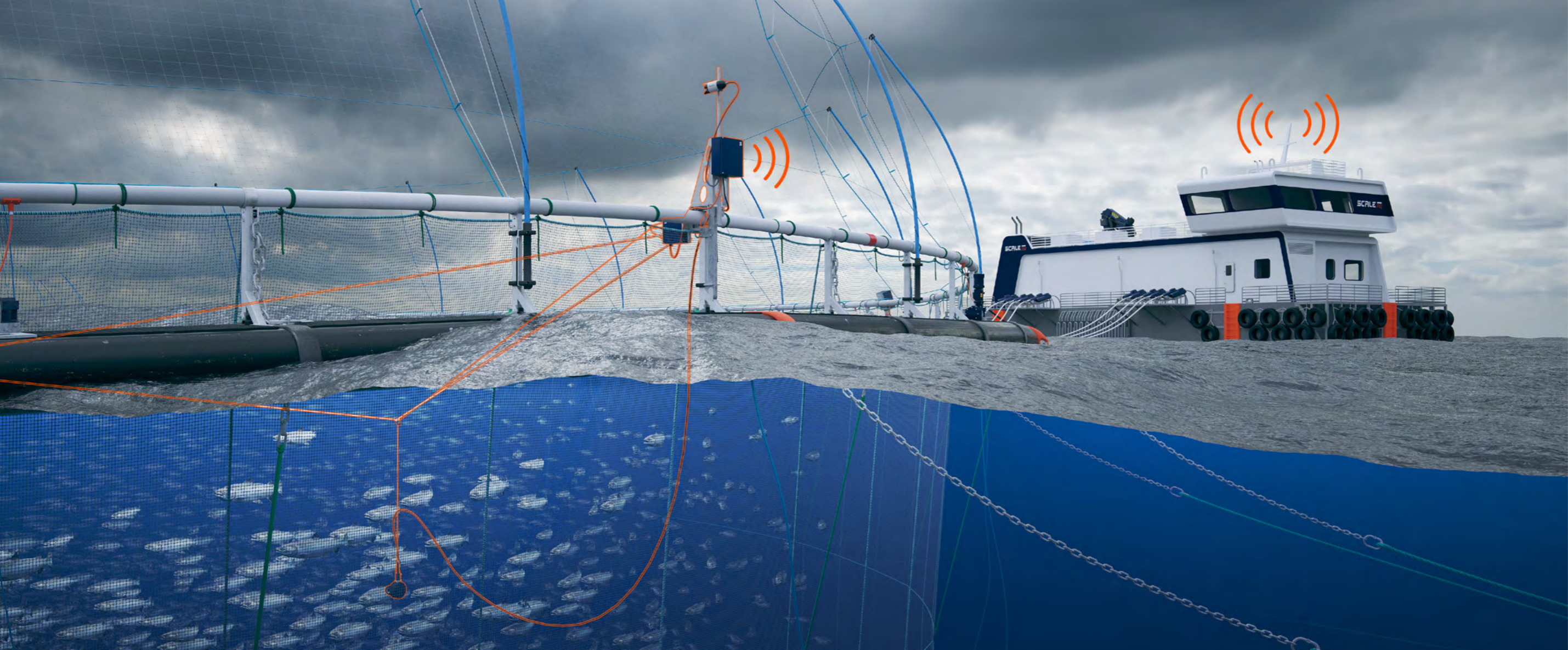
The most light sensitive feeding camera: Orbit FHD

We're launching Orbit FHD – four times more light sensitive than the previous camera version. Due to its dynamic bandwidth, it uses on average half as much bandwidth as previous cameras with normal use, despite its higher resolution. New sensors with calibration free depth sensor, and a possibility for oxygen- and salinity sensor.

- ▶ Dynamic bandwidth – perfect for wireless infrastructure
- ▶ Built-in pellet detection
- ▶ Better color rendering for better contrast on fish and pellets
- ▶ Camera presets
- ▶ New sensors

Compare our cameras

	New Orbit FHD	New Orbit FHD Wide View	Orbit FHD Fixed	Orbit HD	Orbit HD Surface	Orbit HD Dome PTZ Basic	Orbit HD Dome PTZ Extreme
Area of use	Underwater	Underwater Land based	Underwater	Underwater	Pen	Feed barge / pen	Feed barge
Opplesning	Full HD	Full HD	Full HD	HD	Full HD	Full HD	Full HD
Zoom / pan/tilt	360° pan & tilt	360° pan & tilt	Fixed	360° pan & tilt	30x optic, 12x digital	25x optic, 16x digital	35x optic, 12x digital
Compass	✓	✓	✓	✓	–	–	–
Depth	✓	✓	✓	✓	–	–	–
Oxygen	Optional	Optional	Optional	Optional	–	–	–
Temperature	✓	✓	✓	✓	–	–	–
9 axis gyroscope	✓	✓	✓	–	–	–	–
Salinity	Optional	Optional	Optional	–	–	–	–
Model	3900/3910	3920/3930	3700/3710	3450/3650	210	311	360



Software

We supply our own proprietary software Vision together with every camera system. However, in line with our philosophy about openness and freedom of choice, you can also control a ScaleAQ camera or winch using third party solutions. We offer open APIs for camera and winch control. This means that a ScaleAQ camera system can easily be fitted into infrastructure featuring technology and equipment from different suppliers.

Infrastructure and data collection

At present, there are large volumes of video, sensor and feeding data that need to flow from the pen to the feeding operator on the barge or in the feeding control center. ScaleAQ offers both wireless and fiber solutions for this. But you need your data to do more than just flow – it needs to be possible to collect it, store it and

distribute it to a data warehouse or use it in reporting and analysis programs. ScaleAQ has its own integration platform for this purpose: we gather all the relevant digital data from your feed barge and make it available where you want it, including data from systems supplied by third parties.

Multiwinch

Fish don't stand still – which is why your camera can't do that either. A key aspect of our camera system is our proprietary multiwinch. This is a specially designed unit that enables you to move the camera both horizontally and vertically in the pen, ensuring you always have the best image of whatever is going on. This also makes your camera a great tool for checking your net and carrying out inspections for dead fish.

Sensor system

Monitoring of water quality and environmental factors in the pen is becoming more and more important. The relationship between various environmental parameters and appetite, fish health and growth can only be documented and understood through empirical analysis.

A sensor system consists of three main components:

1. The sensors

Depending on what you want to monitor, we offer sensors that are either built into our underwater cameras or are free-standing for use in or outside the pens. These can be single sensors or multisensors / sensor stations.

- ▶ Oxygen
- ▶ Temperature
- ▶ Salinity
- ▶ Conductivity
- ▶ Sea current (magnitude and direction)
- ▶ Turbidity
- ▶ Weather (weather station)

2. Infrastructure

The values measured by each sensor must be robustly transmitted from pen to feeding barge or feed center. ScaleAQ has various solutions for this,

so that the infrastructure can be adapted to local needs. For example, if you have our camera solutions, we use existing cables and power cabinets. We can also transmit sensor data wirelessly from pen to barge, and optionally further than the barge if the barge does not have a stable network. There are no restrictions on the number of sensors you can place per pen.

3. Visualization, storage and analysis

The measured values must be displayed in real time, stored and retrieved for analysis and comparison. For sensors built into our cameras, oxygen and temperature may be displayed in the camera image, allowing the operator to see the measured values where the biomass is located. We also have a dashboard that can display all metrics in real time and that alerts the operator if any values are out of the ordinary. In addition, all sensor measurements are stored in a secure cloud solution, and thus all environmental parameters will be available for analysis and comparison of pen against pen, site against site, region against region.

Orbit 880/881 offers a comprehensive range of environmental data for your facility, measuring oxygen, temperature, depth, salinity and sea current, both magnitude and direction.



The ScaleAQ Sensor Cabinet facilitates connection of up to four sensors in a neat 400 × 200 × 200 mm encapsulation. The cabinet can be powered by either AC or DC voltage, and communication can be wired or wireless. The cabinet can be utilized standalone or connected to a ScaleAQ CIU (PSU for power and communication).

Lights

The use of lights and artificial photoperiod helps create an ideal aquatic environment for a variety of fish species. It is a widely adopted practice in the aquaculture industry, and a key element for suppressing sexual maturity, and increase appetite and growth.

Our underwater lights are lightweight, reliable and economical to use. Our first lights were developed in 1995, and since then we have delivered around 15 000 lights nationally and internationally.

LED lights are replacing the traditional metal halide lamps as they offer a range of benefits, including lower energy consumption, higher efficiency, the ability to dim and adjust the color of the light, and longer service life, thus less need for maintenance.

Its design is designed in a robust construction. An optimal level of automation provides effective control of parameters for use, also allowing the individual control of intensity regulation of the lights. The automated control system allows multiple setups, and everything can be controlled from the office.

Software

The software offers both automatic, manual and user-programmable control options. The automatic mode uses a light sensor that adjusts the light based on the amount of light in the hall. The manual mode works like a light switch, while the user-programmable option lets the user create their desired light schedules to support the fish on the site in a

customized and optimal way, or for different scenarios. The lights communicate wirelessly between the tanks and the office / observation rooms.

Biology

All light sources at all frequencies will reduce sexual maturation in salmon. Of all available lamp technologies, LED technology is the most energy efficient. When it comes to frequency spectrum, the available research indicates that the intensity of the light is the most important factor.

- ▶ Light intensity is the most important factor, any differences in spectrum will be eliminated close to the lamps.
- ▶ Good coverage of a net pen will most likely give the best result, as individual fish vary substantially in volume use and area preferences.
- ▶ Directional lights may give a stronger stimulus to keep fish below lamps than omnidirectional.
- ▶ A «natural» spectrum close to lamps may give the fish an impression of being close to surface, and might keep them deeper more of the time
- ▶ Practical aspects of deployment, how the units handle current, and operational durability is a very important aspect of choosing the right lights.

Orbit LED is a smart light. The lamp has integrated control electronics that are designed to give the user unique flexibility. Processor with memory ensures gradual ramp-up with adjustable time. Together with our software, the user gets access to high end lighting control in a sensible and easy way.

Advantages:

The new Orbit LED offers all the benefits of the LED, and several unique features:

- ▶ Optimal spectral composition
- ▶ Optimal and unique light dispersion downwards where the fish are located; No light is wasted to the atmosphere.
- ▶ A robust construction to withstand the harsh sea conditions
- ▶ Dimming
- ▶ Easy to install
- ▶ Dedicated user-friendly control software
- ▶ Customizable light color upon request

Remote operations

ScaleAQ has extensive experience with wireless communications, both between sites and from sites to landbases. We offer customized communications solutions to address your remote operation and monitoring needs – including everything from single direct links between barges to complex networks that cover many sites and wide geographic expanses. ScaleAQ has the necessary knowledge and the right technology to deliver a robust network that offers high capacity and reliability.

ScaleAQ began to offer remote operating solutions alongside its camera systems during the early 2000s. Over the years, we have gained extensive experience of a variety of technologies, and we are now able to offer some of the best, most comprehensive remote operation solutions currently available on the market. ScaleAQ offers everything from easy remote control of feeding and cameras from the pen and workboat, to full regional feeding centers and comprehensive operational framework agreements.

Centralization

The aquaculture industry is growing, and effective feeding is a key success factor. By centralizing operations, it is possible to establish active working groups through observation and discussion with colleagues. This can enhance the collective understanding of fish behavior and well-being in a range of conditions.

Monitoring of feeding barge technology

We are also able to provide remote monitoring of all feeding barge technology so that alarms and sensors provide an improved overview of the site to technical personnel or farmers. This can encompass anything

from weather sensors, gradient sensors, liquid levels, temperature and light control, etc.

Uptime

Remotely operated feeding requires high levels of uptime in order to ensure access and control is possible at all times. Our fully operated solutions are based on proven equipment that can handle physical stresses such as salt and wind over time. Our support teams are standing by to carry out corrective measures in the event that anything happens on the network. In order to ensure access in the event of major outages, we also offer a “back door” solution that means it is possible to administer equipment on the barge even when there is operational disruption on the main network.

Safety monitoring

In exposed locations, it can be reassuring to have safety monitoring in place so that you can – with consent – track scheduled activities and implement any necessary action in the event of accidents. This form of monitoring is also a useful tool – especially in the summer – for documenting visits by unauthorized persons during periods when the facility is not staffed.

Remote operation is a relatively new term in the aquaculture industry. As volumes per operating unit have increased, the need to be able to maintain continuous oversight of production has increased accordingly. This can range from short-term local requirements in the event of reductions in staffing over weekends and holidays to being able to feed all day when the weather does not permit travel to the facility. It can also extend to the centralization of operations and the creation of a professional environment with groups of farmers gathered together at customized work stations, with each individual holding responsibility for several facilities.





Software

Modern fish farming is a high-tech industry. However, the key aspects are the biology and the fish in the pen. Here at ScaleAQ we therefore believe that it is important that the software you use adds value to your working day and contributes towards the welfare of your fish. Improved feeding procedures, simple and clear visualisation of important events, full control of relevant data, remote control and the automation of installations, documentation, budgeting and reporting tools – the list is almost endless!



FeedStation

There are many important considerations to take into account when selecting a centralized feeding system. Capacities, uptime, ease of use and service intervals are all reasons why FeedStation is often selected. Historically, mechanical components were the main assessment factor, but with an increasing focus on data capture and centralization of feeding, software has become an even more important for the decision-making factor.

Centralized Feeding System

ScaleAQ has more than 40 years of experience in developing and delivering world-leading centralized feeding systems to the global aquaculture industry. Thanks to years of product development, we have optimized the physical components to enable our customers to choose reliable, robust feeding systems for use in both landbased and seabased aquaculture. With the most user-friendly and future-proofed management software available on the market in the shape of FeedStation – ScaleAQ is the natural choice when you need a feeding system that you can rely on for many years to come.

Precision feeding

FeedStation feeding system deliver the right amount of feed, at the right time and in the most gentle way. Critical production parameters such as pressure, temperature and air speed are continuously monitored, and the system makes recommendations than ensure the operator has as much support as possible while carrying out feeding. Built-in tools for analyzing historical feeding profiles, and real-time display of your current profile, allow you to ensure that your company's feeding strategy is adhered to at all times.

The world's first open feeding system

At ScaleAQ, we are very proud to offer the world's first feeding system featuring open and supported integration points for data sharing and process management. Do you have a sensor, a digital solution, or an algorithm that is designed to have an impact on the feeding process? FeedStation's integration points (API) are standing by to receive the control signals! Well-structured and accessible data can provide increased understanding and insight. We want to help our customers become even better

aquaculture operators, which is why we have made all the data that the feeding system produces openly available via the integration points.

Get involved in development

We help our customers to identify what can be reused from older facilities, so that you can easily and cost-effectively upgrade to FeedStation. Please contact us to join the technological shift – we can quickly supply you with a cost estimate for an upgrade to any type of system currently available on the market.

Infrastructure

- ▶ High-speed CAT6a cables offering speeds of up to 10GB/s.
- ▶ Industrial network components supplied by Cisco.
- ▶ Industrial server and PLS components.
- ▶ Electrical cabinets with high quality components.

Capacity

- ▶ 16 feed lines, with the option to expand further.
- ▶ Wide range of selector valves, augers and pipe dimensions available.

Software

- ▶ User interface built on modern HTML5 technology.
- ▶ Advanced reporting, graphs and management capabilities.
- ▶ Open APIs for data exchange and process management.
- ▶ Supports multiple locations with full traceability of changes made.

Vision

Vision is our software platform for camera-based feeding and environmental monitoring. Stylish, animated appearance offering flexibility. Choose between a range of views and personalize your own setup. The software is fast and responsive during use thanks to its focus on user friendliness.

Designed for high resolution screens

Vision supports high resolution screens, including the very latest Ultra-HD, 4K and 5K displays, ensuring superb image quality. Full-HD and 4K resolution cameras can also be used in conjunction with our software to retain the very best in image quality. Improved image processing enhances the quality compared with past software – and that goes for older cameras too. Capable of recording camera footage.

Optimized for remote operation

Easily organize cameras into a range of camera groups – switch rapidly from a camera at location A to one at location B. All cameras in the network can be added to your active Vision installation ensuring that you can quickly switch focus between locations. Use several displays on one computer, even if they are different sizes and resolutions. Flexible, streamlined camera setup: choose the camera you want to see without changing any settings. Make use of pre-defined views that combine images from across

different locations. Logitech, Xbox and PlayStation controllers are all supported, providing the operator with full control of the system – regardless of the number of screens and cameras in use.

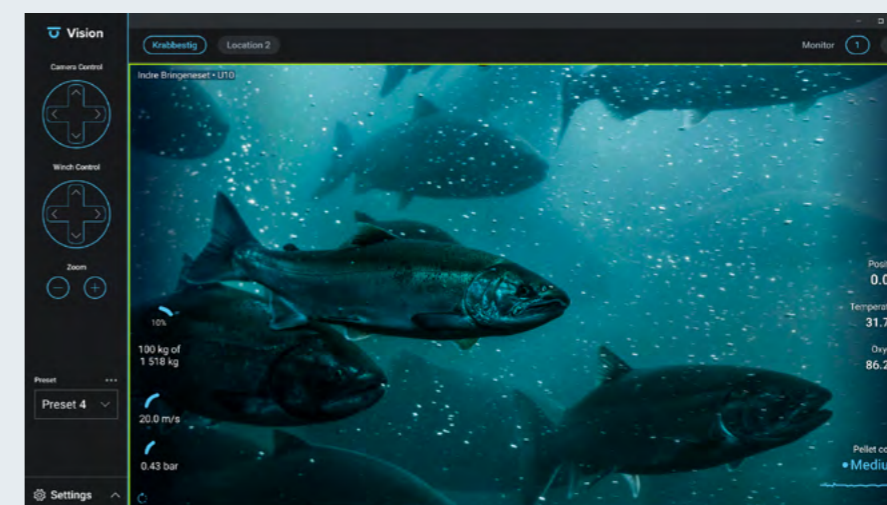
Seamless integration

Vision and FeedStation work together. The display windows provide the operator with full control. Information from the feeding process, adjustments to the key feeding parameters.

Pellet detection

Live detection, counting and marking of pellets on camera feeds, visual presentation of the number of pellets and trend graph. User-defined alarm levels. Detection, counting and marking of pellets in display windows. Visualization of data. Users can add their own alarms. Pellet detection takes place in existing pen cabinets using what is known as edge computing. No need for additional burdensome camera feeds on your network to deal with pellet detection!

- ▶ Modern, customized user interface
- ▶ Designed to ensure the best utilization of high resolution screens and cameras
- ▶ Optimized for remote operation
- ▶ Seamless integration between camera and feeding
- ▶ Integrated gamepad controller
- ▶ Integrated pellet detection
- ▶ Environmental monitoring and cloud storage
- ▶ Enhanced support and service functionality



Modern, customized user interface

Stylish, animated appearance offering flexibility. Choose between a range of views and personalize your own setup. The software is fast and responsive during use thanks to its focus on user friendliness.

Barge Control

Full control of the entire barge: ScaleAQ's barges are designed and equipped for remote operations. The infrastructure on the barge is important to implement any existing and future technology.

Server room

On the barge we have added a small server room with spacious rack for ScaleAQ Server, UPS, Switches and Network CAT6A. There are planned pathways for cables to mast and to below deck for pen access. There will be reserved space for external equipment (radio, company IT infrastructure etc.)

Network infrastructure

The barges will be equipped with modern and future capable generic cabling with CAT6A technology for the barges system communication. The generic cabling can be added to implement company IT

infrastructure on the barge. As well as wireless WAN inside and outside the barge. Furthermore ScaleAQ design the infrastructure to remote operation requirements.

Module based system

ScaleAQ can deliver a complete control system of the barge, the system is module based and different modules can be added by customers requirements. The control and surveillance system is integrated in the ScaleAQ software package delivered with the barge. All systems can be integrated into one user interface, available on the barge or on any other location via internet.

Available modules:

Ballast system

The Nova design can add ballast system to trim the barge when tank loads are causing some trim.

Door status

Doors with weather and water tight characteristics need to be closed to keep the barge safe should anything happen. When barges are remote operated or for extra safety the door status can be added. The system can warn if doors are left open over time.

Power and generator control

The generators can be controlled from the control room or remotely, with status and fault message history and warnings. Power logging and control and surveillance on loads can be used to prevent or warn of failures and unwanted stop.

Bilge control

The bilge and fire alarm can be added to the remote operation system, as well as testing and override of pumps. A diesel leakage system can be integrated, the system will detect and separate a diesel or oil leakage from a water leakage and not start the bilge until it is critical for the barges safety.

Tank status

A complete overview of the barges tanks capacity and filling level can be added to the operators information and planning.

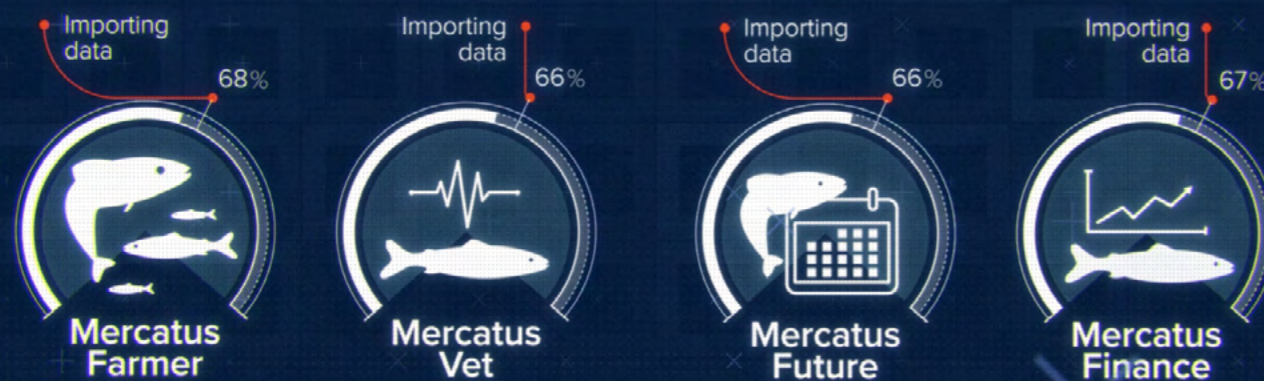
Camera systems

The barges systems can be surveillanced by cameras in the silos, machine rooms, silo room or any other room requested by the user. The system will be integrated in the camera system for the dome and pen cameras in the Vision software.



Mercatus

Biological overview from roe to slaughter, fish health, optimized production planning in the future and full control of financial parameters are all features that make Mercatus an outstanding tool – both in terms of operational control and for making significant strategic decisions. Mercatus offers a modern, user-friendly interface and also works on mobile and tablet. The solution is species-independent, uses an open API in line with ScaleAQ's philosophy of transparency and is used by aquaculture operators – great and small – all around the world.



Mercatus Farmer

Farmer is a production system that covers the entire life cycle from roe to slaughter. It calculates the inventory at each site based on records relating to deployments, feeding, environmental conditions and all other handling of the fish. Information about the fish is retained when moving fish between pens and sites. All fish will then have their own CV in the system that includes all relevant information. Regardless of the size of your company, Farmer provides you with a full overview of your operation in a modern, user-friendly interface. Farmer is built using responsive design that means it is available online, via mobile and tablet.

Mercatus Finance

Finance keeps you up to date on production costs and inventory values throughout the life cycle. Finance creates financial budgets and forecasts, including the development of inventory values and production costs per kilo over time. The solution offers smooth interfaces with several ERP systems, as well as Mercatus Future which is used for production planning. Customer-defined rules ensure optimized accuracy and financial budgets and forecasts can easily be created and used for reporting and benchmarking purposes. The system can be used throughout the entire life cycle.

Mercatus Future

Future provides up-to-date biological information across sites, and is a sophisticated planning tool used to simulate future biological data. Simulated and real-time data are combined, and the ability to run an unlimited number of scenarios makes Future a strong analysis tool that provides help when developing strategy and engaging in decision-making processes. Future can be configured using a range of growth models. Within each scenario, the user can adjust conditions such as temperature, growth rate, mortality rate, feed types, movements, slaughter, treatments and cleaner fish at an overall level, or right down to the individual pen. The system can be used for the entire life cycle and Future lets you plan from the overall company level right down to the very last detail in terms of pen and tank.

Mercatus Vet

Mercatus Vet can be used on its own or integrated with Mercatus Farmer. In the latter case, the two programs exchange useful information. This enables fish health personnel to have effective access to relevant information from Farmer in the Vet interface while they are working. For example, biomass, mortality, lice levels and treatments are all displayed. Visitor reports and prescriptions set up in Vet will be shown in Mercatus Farmer at the corresponding site. This makes it easy for operational personnel on site to maintain a full overview of their fish health documentation. This is particularly useful in the event of audits by customers or the authorities. Prescriptions and visitor reports can be sent as emails directly from Mercatus Vet.



Barges and vessels

When you work at sea, one of the most important things you are aware of is having a secure footing and safe working conditions. We have been involved in the industry out at sea and with sea pens for more than 40 years and we understand the conditions and challenges that you face. ScaleAQ is Norway's leading supplier of feed barges and working vessels for the aquaculture industry. We supply all types of barges and vessels to the fish farming industry. With one of our robust feed barges or service vessels under your feet, you can be absolutely sure that your work can be carried out quickly, efficiently and in an environmentally friendly manner. At the same time, your crew will experience safe working conditions, well-being and comfort on board.

Feeding barges

ScaleAQ has significant expertise and experience in the development and construction of feeding barges for all types of aquaculture. Robust and reliable platforms are an essential component in the harsh marine environment found in modern aquaculture. Developing reliable and functional solutions that ensure efficient operations and safe working conditions that are comfortable and pleasant for the farmers is one of the most important things we do.

Hs

It is important that the barge is adapted to the location in which it is deployed. Exposed locations require barges that can withstand high levels of stress, while for sites further up fjords a more basic structure is sufficient. At ScaleAQ, we supply barges that are certified up to 6.5, which means that you can choose a design to suit your site. Please feel free to use the filter to the left in the menu below if you already know the significant wave height at the site that the barge is to be positioned.

Load capacity

The load capacity for the feeding barge refers to how many tons of feed can be loaded into the silos. What is sometimes forgotten is the capacity and space for all the other things that also need to be brought onto a feeding barge. ScaleAQ offers barge designs that can accommodate between 150 and 900 tons of feed, and which are adapted to their site regardless of whether they are unmanned or serving as a base for both crew and equipment.

Centralized Feeding System

At the heart of a feeding barge is the centralized feeding system. ScaleAQ has more than 35 years of experience in developing and delivering centralized feeding systems to the global aquaculture industry. Our barges can be equipped with up to sixteen feed lines, depending on the size of the barge. With the most user-friendly and future-proofed management software available on the market in the shape of FeedStation – ScaleAQ is the natural choice when you need a feeding system that you can rely on for many years to come.

Barge control

Our program Barge Control offers the farmer the necessary overview of the entire barge. Generators can be remotely controlled while the bilge pump

system can be initiated automatically if the alarm is raised. Meanwhile, the ballast system keeps crew informed about the barge's trim and allows them to adjust it. The program provides notification of open doors, tank statuses and features internal CCTV which means that the barge can also be operated from shore or a neighboring site.

Ensilage

How the raw material is treated is critical when it comes to the future value of the ensilage. At ScaleAQ, we are committed to working on the development, production, supply and installation of comprehensive dead fish management systems of all sizes. Our barges are supplied with our proprietary systems that are customized to meet your needs.

IoT

The internet of things is an important element to consider when choosing a barge. Most farmers have recognized how valuable data and the insights it provides are to ensure optimized operations across the board on site. Unfortunately, very few sites have the infrastructure in place to secure the flow of data. ScaleAQ supplies its barges with industrial network and server solutions that enable aquaculture operators to make the most of their site's potential in digital terms.

Hybridization

ScaleAQ has developed a hybrid system for feeding barges which utilizes an EMS system to ensure lower levels of diesel consumption and consequently lower emissions of CO₂, NO_x and SO_x. The resultant noise reduction also enhances working conditions for the crew. A lower load on the generators also helps to reduce maintenance costs and extend the lifespan of the facility. We use cobalt-free batteries approved by DNV-GL, which ensure installations are safe and have a long service life.



Certification

Our feeding barges are designed and built in accordance with all applicable requirements. Certification and adaptation of each barge takes place in accordance with the requirements of both the customer and the authorities (NS-9415, NYTEK). Customizations to fulfil the requirements of Global G.A.P are available.

HSE

HSE is a key area on board our barges and they are equipped with fire and alarm systems, safety ladders on the ship side, boat stairs to allow straightforward board, all necessary emergency exits, concrete floors at the bottom to ensure good working conditions and cleanliness. The generator automatically starts up the bilge pump system in the case of alarms, and there are sensors fitted to the bilge pumps to prevent diesel being pumped out.

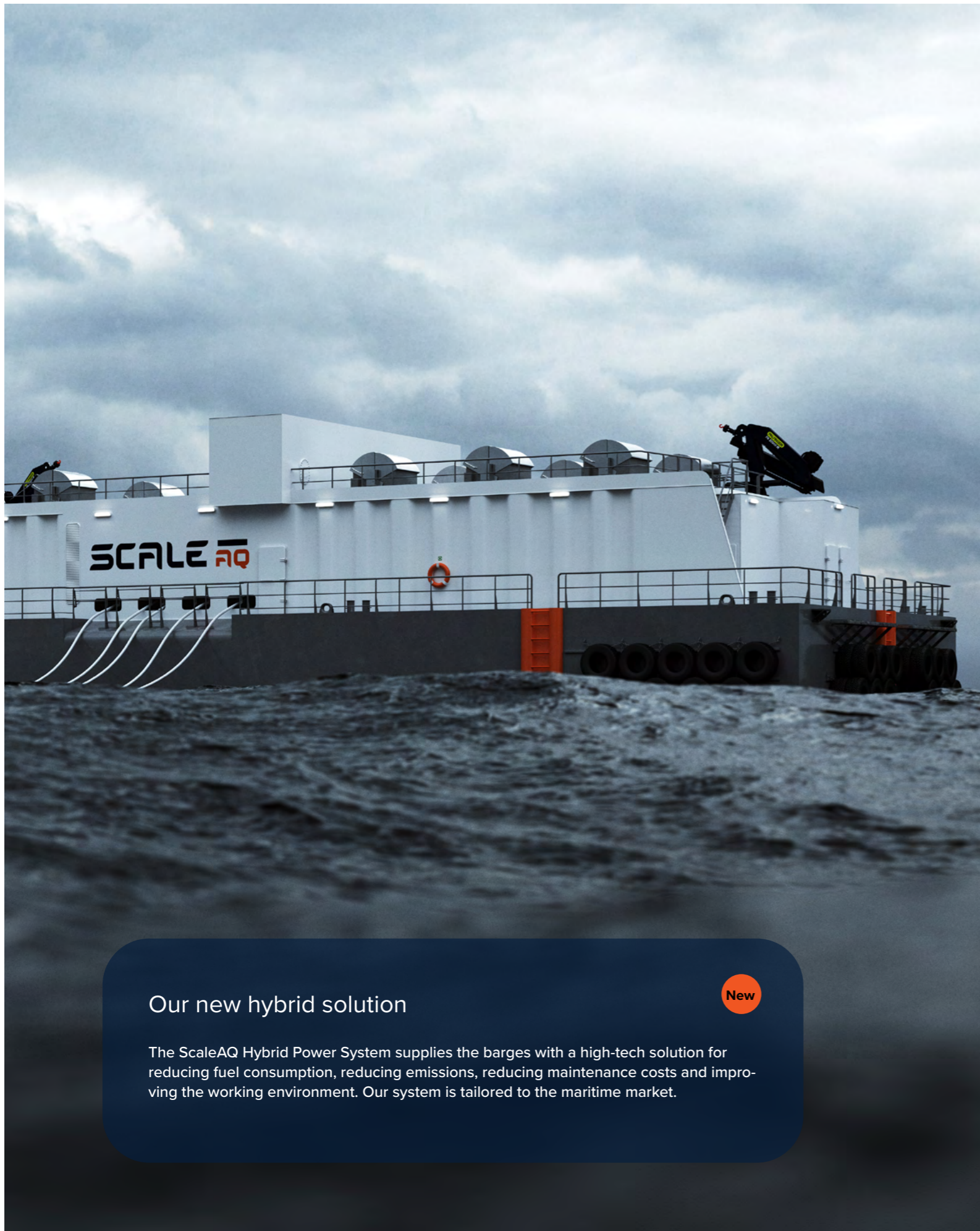
Electricity and standards

Our barges are built using definitions and specifications that comply with Norwegian regulatory requirements. TN-S 400V 50 HZ systems are in accordance with FEL, NEK 400:2018 with heaviness in NEK 400-8-820 Aquaculture facilities and machinery regulations. Generators and any onshore power transformers are adapted for use on the barge whether they are used individually or in combination. Hybrid systems are coordinated with the generators.



Vessels

Moen Marin is today the world's largest supplier of work vessels to the aquaculture industry. The company wants to use this position to show the way in the sustainable development of the industry. More information at moenmarin.no/en



Our new hybrid solution

New

The ScaleAQ Hybrid Power System supplies the barges with a high-tech solution for reducing fuel consumption, reducing emissions, reducing maintenance costs and improving the working environment. Our system is tailored to the maritime market.

Hybrid solutions

ScaleAQ delivers hybrid solutions for barges and vessels. Hybridization helps to reduce environmental emissions, improve the working environment and is economically beneficial. Our new battery solution is produced by the renowned technology company ZEM AS.

How does the system work?

By combining batteries with a diesel engine, the diesel engine can be run at the optimum load point, while charging the batteries and operating the barge. When the batteries are fully charged, the system automatically switches to battery operation and stops the diesel engine.

The system consists of:

- ▶ Batteries
- ▶ Battery rack
- ▶ Inverter / control cabinet
- ▶ Transformer
- ▶ Energy Management System
- ▶ Water cooling

Dashboard

With our hybrid dashboard you can easily keep track of how much fuel your generators are using at all times and how much the hybrid system is saving you.

Customization

Based on technical and financial studies, we can help you choose the best configuration for a new installation or a retrofit. With ZEM, we have also developed a fixed battery case that is much more space-saving than previous solutions.

Benefits

- ▶ Lower emissions (NOx and SOx)
- ▶ Lower fuel consumption (up to 60%)
- ▶ Shorter generator/diesel engine running time (1–7 hours)
- ▶ Less generator/diesel engine maintenance
- ▶ Less acoustic noise
- ▶ Reduced vibration
- ▶ One of the most dependable batteries on the market
- ▶ Batteries approved by DNV-GL
- ▶ Low CO₂ footprint
- ▶ Cobalt-free
- ▶ Long working life
- ▶ Flexible and redundant (multiple strings)



Fish health and hygiene

Maintaining good fish health is our highest priority. Our solutions enable you to provide your fish and equipment with any necessary treatments in a gentle, efficient manner. Our patented technologies enable you to implement basic infection prevention measures, and treat fish that are struggling with the least possible impact on fish health. No resources will be wasted when the salmon reach the end of their life cycle. The effective management of dead fish and silage ensures that we utilise 100% of the resources available from one of the world's most sustainable sources of protein.

Lice control

ScaleAQ has since 2007 been working on chemical- and drug-free treatment solutions for the aquaculture industry. Sea lice have proven to be adaptable beings and are an ongoing challenge for fish farmers. However, they have a low level of tolerance for sudden changes in temperature. Since 2016 the Norwegian aquaculture industry in particular, has mainly used non-medicinal methods for delicing. The most commonly used method is thermal delicing.

Thermolicer®

We supplied our first Thermolicer® in 2014 following seven years of development. Since 2016, thermal delousing has been the most commonly used delousing method in Norway. Thermolicer® is currently used by aquaculture operators in Chile, Canada, the Faroe Islands and the UK to help keep their lice situation in check.

Full effect with zero chemicals

The lice have a low level of tolerance for sudden changes in temperature. This fact is exploited by the Thermolicer® where the fish are bathed briefly in lukewarm water. The lice die and fall off the fish, after which they are collected and destroyed.

In use

The Thermolicer® can be fitted on board service vessels, wellboats and barges. Fish are collected and pumped through the Thermolicer® and then back into the same pen, or into an empty pen.

Along with the Thermolicer®, you receive training and recommendations to ensure that you are able to treat the fish when necessary rather than being dependent on third parties.

Capacity

A standard Thermolicer® is positioned in a 25 foot container. The length of the water trap is 22 meters and it has a capacity of up to 90 tons per hour. The actual capacity will vary somewhat depending on temperature, the size of the fish, the fish pump and the rate of crowding of the fish.

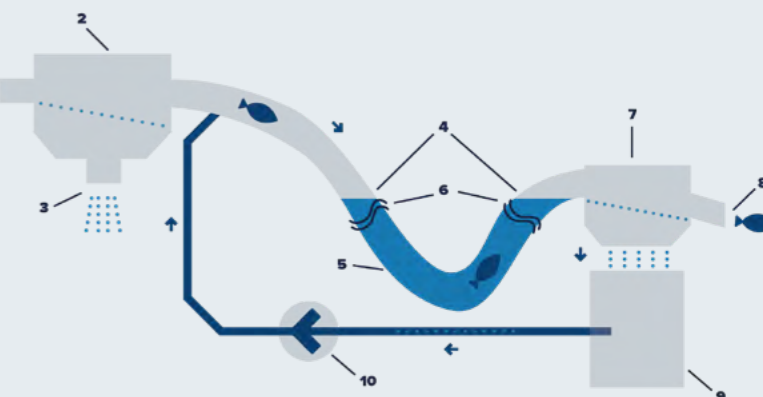
Customization

The Thermolicer® is a patented method of delousing fish in a water trap. The capacity of a standard Thermolicer® is limited by the length and breadth of this water trap. ScaleAQ can also customize treatment loops. This ensures that you can achieve a significantly higher capacity (tons/hour) per line and that the treatment loop can be adapted to suit most vessels.



1. Fish enters Thermolicer® after pumping.
2. Water separation.
3. Sea water is filtered and released.
4. The fish is exposed to lukewarm water.
5. Treatment loop.
6. Water surface.
7. Water separator for treatment water.
8. Fish exits the system.
9. Heated water is circulated to water tank for filtration, aeration and reheating.
10. Treatment water is pumped back to the treatment loop.

NB. The water treatment system is not shown.



Mortality handling

ScaleAQ has been supplying systems for handling dead fish since 1992. The systems can be supplied as standard models or customized according to the customer's needs.

We supply comprehensive receiving facility systems with certified collection containers, grinders and storage tanks, acid dosing systems and systems for collecting dead fish.

development, production, supply and installation of comprehensive dead fish management systems of all sizes. From onshore aquaculture operations to major offshore installations, slaughter facilities, processing plants and fishing vessels. Dead fish equipment supplied by ScaleAQ is easy to use and lasts year after year.

How the raw material is treated is critical when it comes to the future value of the ensilage. At ScaleAQ, we are committed to working on the

New mortality handling system

New

ScaleAQ will launch with an automated solution that will pick up dead fish in all weather conditions and situations without HSE risk and escape risk. This new solution will work for conventional pens, Vortex and submerged or exposed sites.



Dead fish grinder



Pre-grinder DFC-20



Mobile pre-grinder



CleanPump



Acid safety container



Mobile storage tank for ensilage



Tipping basin



Dead fish tipping container



Customized solutions

MASKON
PART OF SCALEAQ

Complete, customized automation systems

Maskon is a global market leader in the production and sale of fully automated vaccination machines for fish. The company sold its first egg sorting machine in 2006, its first automatic vaccination machine to SalMar in 2011, and its first fish pump in 2019. More information at maskon.no/en



Service

As a world class producer for and supplier to the aquaculture industry, it is really important to us that we offer our customers a service they can rely on. We are familiar with the local conditions and our service technicians have practical experience of both onshore and offshore operations, as well as an in-depth knowledge of our products. Our service technicians are equipped with their own service vehicles/boats in order to ensure that new and existing facilities alike are fitted, maintained and serviced. All service history is recorded in our service program.

Service agreements

Regular service and preventive maintenance ensure predictability and uninterrupted production. Take control of your service and maintenance costs. Our certified service technicians are experts in what they do. All service and maintenance performed by ScaleAQ in accordance with supplier specifications. We only use original parts, ensure there is a full service history and that all condition reports are to the highest degree of detail.

The benefits offered to our customers by our service agreements:

- ▶ Cost control in relation to service and maintenance
- ▶ All service and maintenance is carried out by ScaleAQ in accordance with the supplier's specifications
- ▶ All original parts
- ▶ Complete service history
- ▶ Prioritized 24-hour phone support
- ▶ Your own dedicated ScaleAQ coordinator during office hours
- ▶ Access to software updates
- ▶ Technical inspections with status updates
- ▶ Newsletter featuring details of new products

Our sustainability commitments are broad:

Our own value chain



We will limit our own environmental footprint and strive towards increased circularity throughout our value chain.

Our customers



We will help our customers to become more sustainable through our new and existing products and solutions, as well as by providing advice.

Our industry and society



We will assume a clear industry role and drive sustainability in the aquaculture sector.



Hanne Digre

Hanne Digre
Chief Sustainability Officer

Sustainability

As a global technology supplier to the aquaculture industry, sustainability is part of everything we do throughout our business. Through an increased focus on sustainability and biology, ScaleAQ has assumed a clear role in ensuring the development of technology on the terms of biology and the environment.

ScaleAQ aims to be a knowledge-based advisor to the aquaculture industry, and our products include documentation and follow-up that helps to ensure our customers can create added value. This is done through efficiency, reporting and increasing levels of information.

Good environmental, social and governance (ESG) principles are key to all activities undertaken by ScaleAQ, and we have tied our work to the UN's Sustainable Development Goals. For the team at ScaleAQ, sustainability is about the future. We have to take care of the earth's limited resources. We have to manage them in the best possible way without destroying opportunities for future generations.

The world faces major challenges in finding sustainable food sources for its rapidly growing global population. Worldwide demand for seafood is growing. Aquaculture is one of the most sustainable ways to produce food.



The UN Sustainable Development Goals (SDGs) were established in 2015, setting the agenda for where humanity needs to be in 2030. The 17 SDGs cover the entire ESG agenda and deal with issues far beyond the environment and climate.

Challenges related to poverty, gender, health, nutrition and inequality are in many countries just as pressing as the ongoing climate crisis. For us, emphasis on the environment is natural as we are part of an industry that is embedded in our common blue eco-systems and reliant on sound natural resource management. The following goals are considered particularly important to ScaleAQ's business and how we operate. Beyond our primary contribution, through the jobs we create and the taxes we pay, we believe we can support social and economic development and lasting positive change by considering our impact and collaborating across sectors to scale positive contributions.



Circular

As one of the industry's largest suppliers we recognise on a daily basis our responsibility to minimise the footprint made by our business. In our sustainability promises we have made a commitment to reducing the leakage of plastics into the natural environment and to increase the recycling of our products. We have established "Scale Circular" as an initiative for increasing sustainability and a circular economy. We have committed ourselves to several of the UN's sustainability goals, two of which are SDG 12, which concerns responsible consumption and production, and SDG 13, which is designed to combat climate change.

Since 1970 the annual extraction of natural resources has tripled and the linear economy has contributed towards exceeding the Earth's limits. Those of us working in the industry need to switch from thinking about waste to thinking about the possibilities for new products.

The circular economy is all about utilising our resources in a smarter way, with waste becoming a valuable resource and products being reused repeatedly. Technology plays a key role in this because it enables us to create innovative solutions for utilising our resources more efficiently. Aquaculture is a sector that could benefit greatly from the circular economy in terms of both biological and technological materials.



Reuse

Increased reuse of products and materials is part of the solution for becoming more circular. If we can replace purchasing new products and raw materials for our production processes by reusing products, we can reduce both our own and the aquaculture industry's environmental impact. ScaleAQ would like to offer reused equipment certified in accordance with current standards and regulations. Obviously we will continue to maintain the quality of our products.

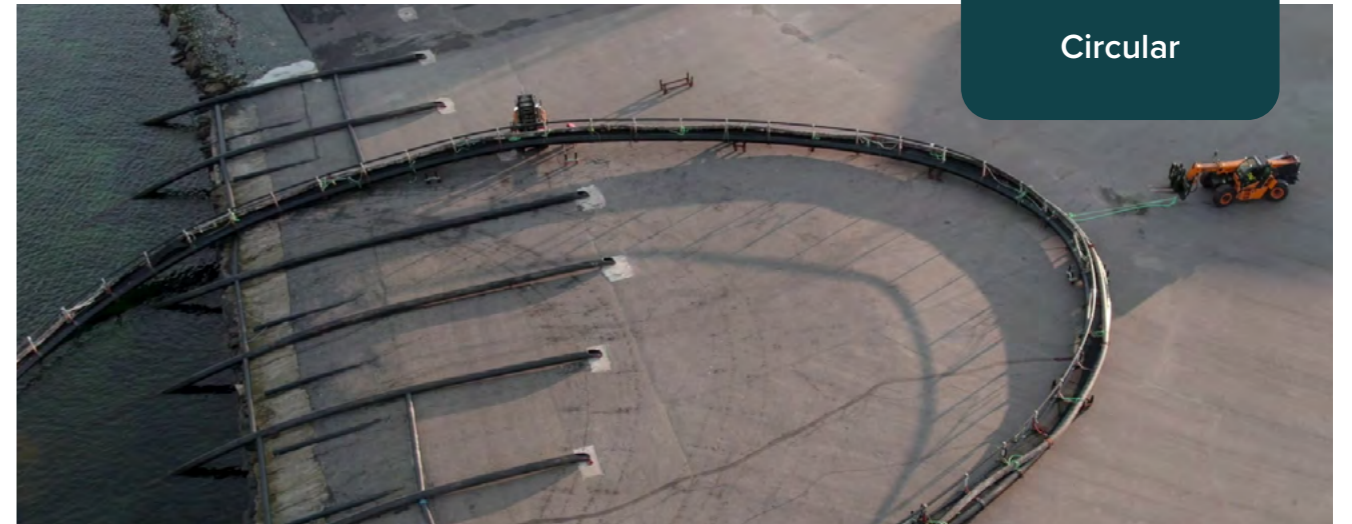
Reusing ropes

The Norwegian aquaculture industry uses 5-6,000 tonnes of rope annually, certified in accordance with NS9415. At the end of the certification period the solution has involved using a recycling facility for recycling our ropes. In collaboration with our project partners, Oceanize and Sinkaberg-Hansen, ScaleAQ is currently investigating the opportunities available for reusing ropes before they are recycled under the GJENTA(U) (REUSE ROPE) project. This project is being funded by the Norwegian Retailers' Environment Fund.

It will form the basis of a process that will enable ropes from the aquaculture industry to be reused

by recertifying them in order to define potential areas for reuse. If the ropes can be recertified and reused, this will reduce the need for the production and transport of new equipment, something which could benefit the environment, the climate and the economy. Our aim is to enable sustainable plastics handling, which means that our plastics will remain in the circular economy and will not simply disappear during export or incineration, etc. This will also be documented by performing a life cycle analysis where the environmental footprint of the ropes is identified and then verified documents describing the environmental profile of reused ropes are obtained by submitting environmental product declarations (EPDs).

Circular



Lifetime extension

ScaleAQ offers lifetime extension of floating collars. In practice lifetime extension means that the whole plastic ring is reused, along with both the handrail and the walkways. Abrasive parts such as steel components are renewed so that the cages can be certified for another 15 years. All plastics are in good condition and only the small abrasive parts need to be renewed. We hope that all our customers will consider the possibilities for extending the life of their floating collars before deciding to buy new ones. In addition to the fact that lifetime extension avoids further CO₂ emissions and the production of virgin plastic, it is currently also profitable due to the high market prices for raw materials.



Recycling

We are working to recycle the materials in as much of our equipment as possible. The materials from our floating collars and bottom rings are eminently suitable for recycling and for use in dedicated fish farming equipment. We offer handrails, walkway tubes and feed tubes made from recycled PE material. By having control throughout the value chain, we have seen that the quality of recycled materials is almost as good as that of virgin plastic. Microscopy analyses show excellent homogeneity and purity in pipes made from recycled materials and no difference from pipes made from virgin materials. This is great news for the industry and provides substantial opportunities for using recycled HDPE plastic. Floating collars that are exposed to strong forces have very strict requirements relating to safety and material strength. The guidelines contained in NS9415 currently make it difficult to use recycled materials in the production of these large structures. This is something we are working on under our green platform project, SirkAQ.



SirkAQ

In December 2022, the "Circular solutions for the aquaculture industry" project, referred to as SirkAQ, received a grant of almost NOK 70 million from the government's Green Platform support scheme.

The aim of the SirkAQ green platform project is to promote the transition from a linear to a circular economy in aquaculture by establishing sustainable circular value chains for plastics from decommissioned equipment by reusing, repairing, extending the life and using recycled materials in new products. The aim is to optimise resource usage and reduce aquaculture's environmental and climate footprint. The vision

for the project is "zero plastic waste by 2030". The project has a strong consortium involving partners from the whole value chain, i.e. producers, suppliers, farmers and recyclers. It also involves strong R&D partners in the relevant disciplines. Scale Aquaculture AS is the responsible company and is managing the project. Read more at sirkqaq.com



scaleaq



scaleaquaculture



scaleaq

✉ post@scaleaq.com

☎ +47 488 52 488

ScaleAQ is an international company within aquaculture. We provide innovation, technology and equipment to customers globally.

SCALE AQ

Scale Aquaculture AS
Beddingen 16
7042 Trondheim

scaleaq.com